Amendments to the Claims:

This listing of the claims will replace all prior versions and listings of the claims in the application.

1. (Previously Presented) A method for multiplexing control signals for disk drives comprising:

developing parallel control signals;

developing serial control signals;

coupling at least one of the parallel control signals and the serial control signals to a common control bus; and

encoding additional commands onto the common control bus comprising:

selecting a coding standard;

determining an unused coding space of the coding standard;

forcing some of the bits into the unused coding space; and

using at least some of the remaining bits of the unused coding space for an additional control communication on the common bus.

2. (Original) A method as recited in claim 1 wherein the first the parallel hard disk drive is an ATA type.

3. (Original) A method as recited in claim 1 wherein the serial hard disk drive is an SATA type.

4. (Original) A method as recited in claim 1 further comprising a second serial hard disk drive.

5. (Original) A method as recited in claim 4 wherein data is sent to the serial hard disk drive and the second serial hard disk drive at effectively double a base data rate.

6. (Original) A method as recited in claim 5 wherein the doubling the base data rate comprises:

developing a sampling data clock;

developing a first data stream at the base data rate;

developing a second data stream at the base data rate; and

multiplexing the first data stream to the common control bus on a rising edge of the base data clock and the second data stream to the common control bus on a falling edge of the base data clock, whereby the common control bus carries both the first data stream and the second data stream at effectively double the base data rate.

7. (Previously Presented) A method for multiplexing control signals for disk drives comprising:

developing parallel control signals;

developing serial control signals;

coupling at least one of the parallel control signals and the serial control signals to a common control bus; and

encoding additional commands onto the common control bus comprising:

determining at least one invalid command in used coding space of a coding standard;

determining unused coding space of the coding standard; and

encoding the at least one invalid command in the used coding space and at least one command in the unused coding space.

8. (Previously Presented) A method for multiplexing control signals for disk drives comprising:

developing parallel control signals;

developing serial control signals;

coupling at least one of the parallel control signals and the serial control signals to at least one of a parallel hard disk drive and a serial hard disk drive by a common control bus; and

encoding additional commands onto the common control bus including:

determining at least one invalid command in used coding space of a coding standard;

determining unused coding space; and

encoding the at least one invalid command in the used coding space and at least one command in the unused coding space;

wherein the coding standard is an 8B10B (8 bit/10 bit) coding standard.

9. (Original) A method as recited in claim 8 wherein the invalid command is 111111.

10. (Original) A method as recited in claim 8 wherein the invalid command is 000000.

11. (Original) A method as recited in claims 9 or 10 wherein the invalid command occurs in a first six bits of the coding standard.

12. (Original) A method as recited in claims 9 or 10 wherein the invalid command occurs in a second bit through a seventh bit of the coding standard.

13. (Original) A method as recited in claims 9 or 10 wherein the invalid command occurs in a third bit through an eighth bit of the coding standard.

14. (Original) A method as recited in claims 9 or 10 wherein the invalid command occurs in a fourth bit through a ninth bit of the coding standard.

15. (Original) A method as recited in claims 9 or 10 wherein the invalid command occurs in a fifth bit through a tenth bit of the coding standard.

16. (Original) A method as recited in claim 6 for calibrating phases of the first data stream and the second data stream comprising:

a) choosing a phase;

b) testing to see if the phase is accurate;

c) receiving results of the testing;

d) logging the results of the testing;

e) repeating steps a) through d) for at least one more phase;

f) finding a threshold rate based on the results of the testing; and

g) dividing the threshold rate by two.

17. (Previously Presented) A disk drive controller comprising:

parallel logic developing parallel control signals;

serial logic developing serial control signals; and

a multiplexer coupling at least one of the parallel control signals and the serial control signals to a common bus; and

an encoder encoding additional commands onto the common control bus comprising:

selecting a coding standard;

determining an unused coding space of the coding standard;

forcing some of the bits into the unused coding space; and

using at least some of the remaining bits of the unused coding space for an additional control communication on the common bus.

18. (Original) A disk drive controller as recited in claim 17 further comprising:

one or more parallel hard disk drives coupled to the common bus and responsive to the parallel control signals; and

one or more serial hard disk drives coupled to the common bus and responsive to the serial control signals.

19. (Original) A hard disk drive controller as recited in claim 18 wherein the parallel hard disk drive is an ATA type.

20. (Original) A hard disk drive controller as recited in claim 18 wherein the serial hard disk drive is an SATA type.

21. (Currently Amended) A hard disk drive controller as recited in claim 18 wherein the serial control signals are sent to at least two of the one [[ore]] or more serial hard disk drives at effectively double a base data rate.

22. (Original) A hard disk drive controller as recited in claim 21 wherein the doubling the base data rate comprises:

serial logic developing a sampling data clock;

serial logic developing a first data stream at the base data rate;

serial logic developing a second data stream at the base data rate; and

the multiplexer multiplexing the first data stream to the common control bus on a rising edge of the base data clock and the second data stream to the common control bus on a falling edge of the base data clock, whereby the common control bus carries both the first data stream and the second data stream at effectively double the base data rate.

23. (Currently Amended) A hard disk drive controller comprising:

parallel logic developing parallel control signals;

serial logic developing serial control signals; and

a multiplexer coupling at least one of the parallel control signals and the serial control signals to a common bus[[.]];

an encoder encoding additional commands onto the common bus, the encoding comprising:

determining at least one invalid command in used coding space of a coding standard;

determining unused coding space; and

encoding the at least one invalid command in the used coding space and at least one command in the unused coding space.

24. (Original) A hard disk drive controller as recited in claim 23 wherein the coding standard is an 8B10B (8 bit/10 bit) coding standard.

25. (Original) A hard disk drive controller as recited in claim 24 wherein the invalid command is 111111.

26. (Original) A hard disk drive controller as recited in claim 24 wherein the invalid command is 000000.

27. (Original) A hard disk drive controller as recited in claims 25 or 26 wherein the invalid command occurs in a first six bits of the coding standard.

28. (Original) A hard disk drive controller as recited in claims 25 or 26 wherein the invalid command occurs in a second bit through a seventh bit of the coding standard.

29. (Original) A hard disk drive controller as recited in claims 25 or 26 wherein the invalid command occurs in a third bit through an eighth bit of the coding standard.

30. (Original) A hard disk drive controller as recited in claims 25 or 26 wherein the invalid command occurs in a fourth bit through a ninth bit of the coding standard.

31. (Original) A hard disk drive controller as recited in claims 25 or 26 wherein the invalid command occurs in a fifth bit through a tenth bit of the coding standard.

32. (Original) A hard disk drive controller as recited in claim 22 for calibrating phases of the first data stream and the second data stream comprising:

a) choosing a phase;

b) testing to see if the phase is accurate;

c) receiving results of the testing;

d) logging the results of the testing;

e) repeating steps a) through d) for at least one more phase; and

f) finding a best sampling pointer based on the results of the testing.

33. – 52. (Cancelled)

53. (Currently Amended) A disk drive controller for disk drives comprising:

parallel logic developing parallel control signals;

serial logic developing serial control signals; and

a multiplexer adapted for coupling at least one of the parallel control signals and the serial control signals to at least one of an external parallel hard disk drive and a first external serial hard disk drive by a common control bus[[.]];

the controller further encoding additional commands onto the common control bus, wherein the encoding comprising:

selecting a coding standard;

determining an unused coding space of the coding standard;

forcing some of the bits into the unused coding space; and

using at least some of the remaining bits of the unused coding space for an additional control communication on the common bus.

54. (Previously Presented) A disk drive controller as in claim 53, wherein:

the first the parallel hard disk drive is an ATA type;

the first serial hard disk drive is an SATA type;

the multiplexer further coupling at least one of the parallel control signals and the serial control signals to a second serial hard disk drive by the common control bus;

wherein data is sent to the first serial hard disk drive and the second serial hard disk drive at double a base data rate, the doubling the base data rate comprising:

developing a sampling data clock;

developing a first data stream at the base data rate;

developing a second data stream at the base data rate; and

multiplexing the first data stream to the common control bus on a rising edge of the base data clock and the second data stream to the common control bus on a falling edge of the base data clock so that the common control bus carries both the first data stream and the second data stream at double the base data rate; and

calibrating phases of the first data stream and the second data stream comprising:

(a) choosing a phase;

(b) testing to see if the phase is accurate;

(c) receiving results of the testing;

(d) logging the results of the testing;

(e) repeating steps (a) through (d) for at least one more phase;

(f) finding a threshold rate based on the results of the testing; and

(g) dividing the threshold rate by two.

55. (Previously Presented) A method for controlling disk drives comprising:

developing parallel control signals;

developing serial control signals;

coupling at least one of the parallel control signals and the serial control signals to at least one of a parallel hard disk drive and a first serial hard disk drive by a common control bus; and

encoding additional commands onto the common control bus, wherein the encoding comprising:

selecting a coding standard;

determining an unused coding space of the coding standard;

forcing some of the bits into the unused coding space; and

using at least some of the remaining bits of the unused coding space for an additional control communication on the common bus.

56. (Previously Presented) A method of controlling disk drives as in claim 55, wherein:

the first the parallel hard disk drive is an ATA type;

the first serial hard disk drive is an SATA type;

the coupling including coupling at least one of the parallel control signals and the serial control signals to a second serial hard disk drive by the common control bus;

wherein data is sent to the first serial hard disk drive and the second serial hard disk drive at double a base data rate, the doubling the base data rate comprising:

developing a sampling data clock;

developing a first data stream at the base data rate;

developing a second data stream at the base data rate; and

multiplexing the first data stream to the common control bus on a rising edge of the base data clock and the second data stream to the common control bus on a falling edge of the base data clock so that the common control bus carries both the first data stream and the second data stream at double the base data rate; and

calibrating phases of the first data stream and the second data stream comprising:

(a) choosing a phase;

(b) testing to see if the phase is accurate;

(c) receiving results of the testing;

(d) logging the results of the testing;

(e) repeating steps (a) through (d) for at least one more phase;

(f) finding a threshold rate based on the results of the testing; and

(g) dividing the threshold rate by two.

57. (Previously Presented) A method for adding and operating at least a first and a second SATA serial type hard disk drive in a system including at least one parallel ATA type hard disk drive, the method comprising:

developing parallel control signals;

developing serial control signals;

multiplex coupling at least one of the parallel control signals and the serial control signals to at least one of the parallel hard disk drive and the first serial hard disk drive by a common control bus;

sending data to the first serial hard disk drive and the second serial hard disk drive at effectively double a base data rate; and

encoding additional commands onto the common control bus comprising:

selecting a coding standard;

determining an unused coding space of the coding standard;

forcing some of the bits into the unused coding space; and

using at least some of the remaining bits of the unused coding space for an additional control communication on the common bus.

58. (Previously Presented) A method as in claim 57, wherein the sending data to the first serial hard disk drive and the second serial hard disk drive at effectively double a base data rate comprises:

developing a sampling data clock;

developing a first data stream at the base data rate;

developing a second data stream at the base data rate; and

multiplexing the first data stream to the common control bus on a rising edge of the base data clock and the second data stream to the common control bus on a falling edge of the base data clock, whereby the common control bus carries both the first data stream and the second data stream at effectively double the base data rate.

59. (Cancelled)

60. (Previously Presented) A method as recited in claim 7, wherein the encoding additional commands onto the common control bus further comprising:

forcing some of the bits into the unused coding space;

using at least some of the remaining bits of the unused coding space for an additional control communication on the common bus; and

coupling at least one of the parallel control signals and the serial control signals to at least one of a parallel hard disk drive and a serial hard disk drive by the common control bus.

61. (Previously Presented) A method as recited in claim 1, wherein the selected coding standard comprises an 8-bit/10-bit encoding standard.

62. (Previously Presented) A method as recited in claim 1, wherein the forcing of some of the bits comprises forcing at least 6 of the bits to be all "1" bits or all "0" bits.

63. (Previously Presented) A method as recited in claim 1, wherein the remaining bits used for additional communication are used to support two simultaneous communications of data so that the transport speed of data over the common bus can be increased by effectively a factor of two.

64. (Previously Presented) A method as recited in claim 63, wherein common bus includes a bus between the a processor and a hard disk drive (HDD).

65. (Previously Presented) A method as recited in claim 1, wherein the encoding further comprises encoding a first set of code words in a first coding space having at least n available code words to a second set of code words in a second coding space having at least m=2n+1 available code words, each of the n available unique code words in the first coding space being transformable to two different unique code words in the second coding space, and the second coding space including extra additional code words not used for the transformation from the first coding space to the second coding space, the extra additional code words being used to communicate control information on the common control bus.

66. (Previously Presented) A method as recited in claim 65, wherein the control information on the common control bus is used to permit at least two hard disk drive devices to communicated data simultaneously on the common bus at a rate that is double the rate of a single hard disk drive device.

67. (Previously Presented) A method as recited in claim 66, wherein the doubling of rate is achieved by permitting simultaneous master operation of a first hard disk drive and slave operation of a second hard disk drive.

68. (Previously Presented) A method as recited in claim 65, wherein the wherein the first coding space is an 8-bit coding space having 256 available code words and the second coding space is at least a 10-bit coding space having 1024 available code words, wherein each of the 256 first coding space words are transformed into 512 unique transformed code words in the second coding space, and at wherein at least some of the 1024-512 remaining code words in the second coding space are available as control words for control signaling on the common control bus.

69. (Previously Presented) A method as recited in claim 5, wherein the coding standard is an n-bit / m-bit coding standard where m is greater than n.

70. (Previously Presented) A hard disk drive controller as recited in claim 17, wherein the coding standard is an n-bit / m-bit coding standard where m is greater than n.

71. (Previously Presented) A method as recited in claim 5 wherein the effectively doubling the base data rate comprises:

developing a sampling data clock;

developing a first data stream at a base data rate;

developing a second data stream at the base data rate;

generating control signals associated with the first data stream and the second data stream using an encoding scheme that provides a plurality of unused code words for controlling the disk drive serial bus not needed to represent data in the first or second data stream for use in controlling the first and second data streams on the disk drive serial bus;

multiplexing the first data stream to a disk drive serial bus on a rising edge of the base data clock and the second data stream to the disk drive serial bus on a falling edge of the base data clock; and

the disk drive serial bus is adapted to carry both the first data stream and the second data stream at effectively double the base data rate as a result of the provision of the plurality of unused code words for controlling the disk drive serial bus.

72. (Previously Presented) A hard disk drive controller as recited in claim 21 wherein the effectively doubling the base data rate comprises:

developing a sampling data clock;

developing a first data stream at a base data rate;

developing a second data stream at the base data rate;

generating control signals associated with the first data stream and the second data stream using an encoding scheme that provides a plurality of unused code words for controlling the disk drive serial bus not needed to represent data in the first or second data stream for use in controlling the first and second data streams on the disk drive serial bus;

multiplexing the first data stream to a disk drive serial bus on a rising edge of the base data clock and the second data stream to the disk drive serial bus on a falling edge of the base data clock; and

the disk drive serial bus is adapted to carry both the first data stream and the second data stream at effectively double the base data rate as a result of the provision of the plurality of unused code words for controlling the disk drive serial bus.